

specification at least at page 32, lines 4-8. Reconsideration and allowance of the claims in view of the above-amendments and the remarks that follow are respectfully requested.

Applicants thank Examiner Grant for indicating that claims 40, 48-49, 99 and 100 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

On page 2 the Office Action objects to the disclosure because the amendment to the specification at page 66, lines 28-29 (submitted 12/29/1997) appears to be incorrect because it interrupts the current language at page 66 of the specification. The specification has been amended to overcome the objection.

On page 3 the Office Action rejects claims 35-38, 41-42, 50-51, 71-73, 96-98, 101-105 and 107-108 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,477,262 to Banker et al. (hereafter Banker) and U.S. Patent 5,367,330 to Haave et al. (hereafter Haave). This rejection is respectfully traversed.

Independent claim 36 has been amended to incorporate the limitations of claim 99, including the limitations of intervening claim 98. The Examiner has indicated that claim 99 would be allowable if rewritten in independent form including all of the limitations of the base claims and intervening claims. Therefore, claim 36 is allowable. Similarly, independent claim 35 has been amended to incorporate the limitations of claims 98 and 99. Banker and Haave, alone or in combination, do not disclose or suggest the limitations of claims 98 and 99. Therefore, claim 35 is also allowable.

Claims 37-38, 41-42, 50-51 and 71-73 depend from claim 35 and claims 96-97, 101-105 and 107-108 depend from claim 36. As discussed above, claims 35 and 36 are allowable. For this reason and the additional features they recite, claims 37-38, 41-42, 50-51, 71-73, 96-97, 101-105 and 107-108 are allowable. Claim 98 has been cancelled. Therefore, the rejection of claim 98 is rendered moot. Withdrawal of the rejection of claims 35-38, 41-42, 50-51, 71-73, 96-98, 101-105 and 107-108 under 35 U.S.C. § 103(a) is respectfully requested.

On page 6 the Office Action rejects claims 39, 43-47, 52-70 and 74-95, presumably under 35 U.S.C. § 103(a) as being unpatentable over Banker and Haave. This rejection is respectfully traversed.

Claims 39, 43-47, 52-70 and 74-95 depend from claim 35. As discussed above, claim 35 is allowable. For this reason and the additional features they recite, claims 39, 43-47, 52-70 and

74-95 are allowable. Withdrawal of the rejection of claims 39, 43-47, 52-70 and 74-95 under 35 U.S.C. § 103(a) is respectfully requested.

On page 7 the Office Action rejects claim 106 under 35 U.S.C. § 103(a) as being unpatentable over Banker and Haave and further in view of U.S. Patent 4,802,008 to Walling (hereafter Walling). This rejection is respectfully traversed.

Claim 106 depends from claim 36. As discussed above, claim 36 is allowable. For this reason and the additional features recited therein, claim 106 is allowable. Withdrawal of the rejection of claim 106 under 35 U.S.C. § 103(a) is respectfully requested.

On page 7 the Office Action objects to claims 40, 48, 49, 99 and 100 as being dependent upon a rejected base claim. Claims 40, 48 and 49 depend from claim 35. As discussed above, claim 35 is allowable. Therefore, claims 40, 48 and 49 are also allowable and withdrawal of the objection to claims 40, 48 and 49 is respectfully requested. Claim 99 has been cancelled. Therefore, the objection to claim 99 is rendered moot and withdrawal of the objection to claim 99 is respectfully requested. Claim 100 depends from claim 36. As discussed above, claim 36 is allowable. Therefore, claim 100 is allowable and withdrawal of the objection to claim 100 is respectfully requested.

For at least the reasons set forth above, applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance of the claims are earnestly solicited.

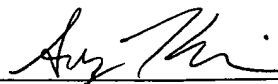
Should the Examiner believe that anything further is desired in order to place the application in even better condition for allowance, the Examiner is invited to contact applicants' undersigned representative at the telephone number listed below.

Attached hereto is a marked-up version and an executed version of the changes made to the claims by the current amendment. The attached pages are captioned "**Version with markings to show changes made**" and "**Version showing executed changes**", respectively.

Application No.: 08/912,934

Respectfully submitted,

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Attachments: Version With Markings to Show Changes Made  
Version Showing Executed Changes

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**In the Claims**

35. (Twice Amended) An operations center for generating menus and a digital data signal to be used in television program delivery, comprising:

a receiver, wherein information, including information on television programs, is received;

a memory for storing the received information;

a first processor for generating menus using the information stored in memory, wherein the menus are generated automatically by the operations center by analyzing the information using a heuristic;

a display, operably connected to the first processor, for displaying the generated menus;

an input device, operably connected to the first processor, for entering changes to the displayed menus;

a second processor, operably connected to the first processor, for generating a digital data signal containing data from the changed or displayed menus; and

a transmitter, operably connected to the second processor, for transmitting the generated digital data signal, whereby menus may be generated using the contained data on the transmitted digital data signal.

36. (Twice Amended) A method of generating menus and a digital data signal for use at television program viewer locations, comprising:

storing menu format data;

receiving input data about television programs;

storing the received input data;

generating a draft menu through the use of the stored input data and the menu format data, wherein the draft menu is generated automatically by an operations center by analyzing the input data using a heuristic;

displaying the draft menu;

editing the displayed draft menu, wherein the edited menu includes a program line-up;

repeating the steps of generating, displaying, and editing to generate additional edited menus;

processing the edited menus to generate a digital data signal; and

transmitting the digital data signal for use at viewer locations, whereby at least one of the edited menus may be viewed by a viewer.

100. (Amended) The method of claim 36[99] wherein the heuristic causes a program to move closer to or further from the top of the menu based on the input data about the program.

**VERSION SHOWING EXECUTED CHANGES**

**In the Claims**

35. (Twice Amended) An operations center for generating menus and a digital data signal to be used in television program delivery, comprising:

a receiver, wherein information, including information on television programs, is received;

a memory for storing the received information;

a first processor for generating menus using the information stored in memory, wherein the menus are generated automatically by the operations center by analyzing the information using a heuristic;

a display, operably connected to the first processor, for displaying the generated menus;

an input device, operably connected to the first processor, for entering changes to the displayed menus;

a second processor, operably connected to the first processor, for generating a digital data signal containing data from the changed or displayed menus; and

a transmitter, operably connected to the second processor, for transmitting the generated digital data signal, whereby menus may be generated using the contained data on the transmitted digital data signal.

36. (Twice Amended) A method of generating menus and a digital data signal for use at television program viewer locations, comprising:

storing menu format data;

receiving input data about television programs;

storing the received input data;

generating a draft menu through the use of the stored input data and the menu format data, wherein the draft menu is generated automatically by an operations center by analyzing the input data using a heuristic;

displaying the draft menu;

editing the displayed draft menu, wherein the edited menu includes a program line-up;

repeating the steps of generating, displaying, and editing to generate additional edited menus;

processing the edited menus to generate a digital data signal; and

transmitting the digital data signal for use at viewer locations, whereby at least one of the edited menus may be viewed by a viewer.

100. (Amended) The method of claim 36 wherein the heuristic causes a program to move closer to or further from the top of the menu based on the input data about the program.

**ADDED PARAGRAPHS IN CLEAN FORM**

**In the Specification**

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**E.1. Menu Structure**

The series of menus shown in Figure 22 is the normal or standard format for a variety of alternative embodiments to the present invention. An introductory screen upon power up that contains important messages, followed by a home menu 1010 with major programming categories is the basis upon which many alternative embodiments of the menu driven selection process can be built.

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Skipping a sequence or level of the menu structure is possible and perhaps desired in certain instances. In simple alternate embodiments it is possible to combine the home menu 1010 and introductory menu 1000 into one menu that performs both functions. It will be obvious to one skilled in the art that the specific functions of the Home menu 1010 and Introductory menu 1000 may be exchanged or shared in a number of ways. It is also possible to allow a user to skip directly from the introductory menu 1000 to a submenu 1050. This can be accomplished most easily with a separate direct access remote control 900 button. Generally, a subscriber will access a television program through execution of a submenu 1050.

The During program menus 1200 are enacted by the set top terminal 220 only after the subscriber has selected a television program. These menus provide the subscriber with additional functionality and/or additional information while he is viewing a selected program. The During program menus 1200 sequence can be further subdivided into at least two types of menus, Hidden Menus 1380 and Program Overlay Menus 1390.

To avoid disturbing a subscriber during viewing of a program, the Hidden Menus 1380 are not shown to the subscriber but instead "reside" at the set top terminal 220 microprocessor. The Hidden Menus 1380 do not effect the selected program audio. The microprocessor awaits a button entry either from the remote 900 or set top terminal 220 buttons before executing or displaying any Hidden Menu options. The Hidden Menus 1380 provide the subscriber with additional functions such as entering an interactive mode or escaping from a selected program.

Program Overlay Menus 1390 are similar to Hidden Menus 1380 in that they occur during a program. However, the Program Overlay Menus 1390 are overlaid onto portions of the television screen and not hidden. The Program Overlay Menus 1390 allow the subscriber to continue to watch the selected television program with audio but place additional information on



portions of the television screen. Most overlays cover small portions of the screen allowing the subscriber to continue to comfortably view his program selection. Other Overlays which are by their nature more important than the program being viewed will overlay onto greater portions of the screen. In the preferred embodiment, some Program Overlay Menus 1390 reduce or scale down the entire programs video screen and redirect the video to a portion of the screen.

All menu entries may be made either from buttons available on the top cover of the set top terminal 220 or from the remote 900.

Figure 23a shows the preferred embodiment for subscriber selection of television programming. Figure 23b shows additional major menu 1020 categories, 1042, 1044, 1046, 1048, which may used with the invention. Again, the introductory menu 1000 followed by the home menu 1010 is the preferred sequence of on-screen displays. In the preferred embodiment shown in 23a, the home menu 1010 provides a choice of ten major menus 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040. Upon selection of a major menu 1020 category from the home menu 1010, the program proceeds to a major menu 1020 offering further viewer selections. Each major menu 1020 is customized to target the expected viewership. Depending on the number of available program choices the major menus 1020 either breakdown the major category into sub-categories or provide the subscriber with access to further information on a particular program.

For example, the major menu 1020 for children's programming provides a list of subcategories 1052 from which the subscriber selects. Upon selection of a subcategory a submenu 1054, 1056 listing program choices within that sub-category is shown to the subscriber. Upon selection of a particular programming choice within the first submenu 1050, the subscriber is then provided with a second submenu 1058 describing the program that the subscriber has selected. From this menu, the subscriber may now confirm his program choice and receive a confirmation submenu 1060 from the set top terminal 220 software.

Since the system utilizes digital signals in compressed format, High Definition Television programming can also be accommodated through the menu system. In addition, since the set top terminal 220 has two way communication with the cable headend, interactive television programming is possible, with return signals generated by the set top terminal 220. Similarly, the system can support "movies on demand" where a subscriber communicates through the set top terminal 220 with an automated facility to order movies stored at the facility.

Using this on-screen menu approach to program selection, there is nearly an unlimited number of menus that can be shown to the subscriber. The memory capability of the set top terminal 220 and the quantity of information that is sent via the program control information signal are the only limits on the number of menus and amount of information that can be displayed to the subscriber. The approach of using a series of menus in a simple tree sequence is both easy for the subscriber to use and simply implemented by the set top terminal 220 and remote control device 900 with cursor movement. A user interface software programmer will find many obvious variations from the preferred embodiment shown.

Figures 24a and 24b show examples of introductory menu screens that are displayed on the subscriber's television. Figure 24a, the preferred embodiment, welcomes the subscriber to the cable system and offers the subscriber three options. The subscriber may choose regular cable television (channels 2 through 39), programs on demand (e.g., movies), or instructions on the use of the remote control 900. Other basic program options are possible on the introductory menu screen 1000. For example, instead of, or in addition to, the remote control 900 instructions, a system "help" feature can be offered on the introductory menu 1000.

Fig 24b shows an alternate embodiment for the introductory menu screen 1000. In the upper left-hand corner of the menu, there is a small window 1002 that may be customized to the subscriber. A subscriber will be given the option of showing the current time in this window. In the upper right-hand corner a second customized window 1004 is available in which a subscriber may show the day and date. These windows may be easily customized for subscribers to show military time, European date, phase of the moon, quote of the day, or other informational messages. These windows may be customized by subscribers using on-screen menu displays following the introductory menu 1000.

In the preferred embodiment, the subscriber is given the capability of accessing base channels such as regular broadcast TV and standard cable channels directly from the introductory menu 1000 by entering the channel number. The subscriber is also given the capability of directly accessing his account with the cable company. Further, in the preferred embodiment, the subscriber may directly access a major menu 1020 and bypass the home menu screen 1010. If the subscriber is familiar with the programming choices available on the major menus 1020, he may select an icon button 960, or a lettered key (alpha key) from his remote control 900 and directly access the desired major menu 1020. If any key entry other than those

expected by the set top terminal 220 software program is made, the home menu 1010 is placed on the television screen. In addition, after a period of time if no selections are made from the introductory menu 1000, the program may default to the home menu screen 1010.

Figures 25a, 25b, 25c, and 25d are examples of home menus 1010 that may be used in the set top terminal 220 software. Figures 25a-25d all employ multiple window techniques to make the menu user friendly and offer a significant number of choices. It is preferred that a channel line up and the major menu 1020 categories both appear on the home menu 1010.

Figure 25a, the preferred home menu 1010 embodiment, displays both the standard channel line up and the programming on demand icons for selection by the subscriber. Figure 25a also shows various levels of subscription programming, including a "Basic" cable package and a "Basic Plus" package. Each of the choices of subscription programming preferably is assigned a different color. This increases the user friendliness of the present invention.

In Figures 25b-25d, the left half of the screen is used to list the channel number and network abbreviation of the most popularly watched networks. The right half of the screen offers access to a variety of major menus 1020 listed by category names.

Figure 25b shows an embodiment in which only eight major menus 1020 are utilized. By pressing the alpha-numeric or icon key 960 corresponding to the category of programs the subscriber desires, the appropriate major menu 1020 is accessed. In addition, the subscriber may employ an on-screen cursor to select any option shown in the menu. To move the cursor, the subscriber may use either the cursor movement keys on the remote control 900 or similar keys located at the top of the set top terminal 220.

Figure 25c shows how additional major menus 1020 can be displayed on the home menu screen 1010. When there is no longer room available for additional major menu 1020 choices on the home screen, the subscriber may access a second screen of the home menu 1010. For example, in Figure 25c, if additional major menus 1020 "J" through "Z" existed, the subscriber would access those menus by highlighting and selecting the J through Z menu option(or press the J-Z on his remote 900). After selecting J through Z, the second or extended home menu screen 1010 would appear on a subscriber's television set. This menu would then list options J through Z separately by name. Theoretically, the home menu 1010 may have many extended home menu screens. However, any more than a few extended home menu screens would confuse the average subscriber.

The home menu 1010 of Figure 25d adds an additional feature at the bottom of the television screen 1011. This option allows a subscriber to see only those program selections that are available on broadcast television. Figures 25a-d are but a few of the numerous variations available for the home menu 1010.

Additionally, as shown in Figure 26, in an alternate embodiment, the home menu 1010 (or menu which would normally follow the introductory menu 1000) can be simply the standard cable channel line-up. Offering the standard cable line-up on a separate menu may make selection easier for viewers with small television screens.

Figures 27a and 27b are examples of major menus 1020. In particular, Figures 27a and 27b show a major menu 1040 whose category is hit movies.

The hit movie category is a list of recently released movies which have been found to be popular among movie goers. This movie list is changed once or twice a week to keep in line with new movie releases. Again, multi-window and customized window techniques are utilized to make the menu as user friendly as possible.

Figure 27a shows the preferred embodiment of the hit movies menu 1040. The hit movies menu icon along with the hit movies category letter A are displayed. The current date and time are displayed at the top of the screen over a menu background. Ten movie selections are displayed in the center of the screen 1009, each in a box which may be highlighted when selected. In the lower left part of the screen, a logo window 1512 is available as well as two other option choices 1011, Movie Library and Return to Cable TV. In an alternate embodiment, the return to Cable TV option is changed to return to the Home menu 1010 (or return to other viewing choices).

In Figure 27b, the left upper window 1002 displays current time and the right upper window 1004 displays a message. This menu provides a list of eight movie titles and their rating 1009. If the subscriber desires further information on any particular movie he may select a movie using the cursor movement buttons and press the "go" button on the remote control 900 or set top terminal 220 box.

It is important in creating user friendly interfaces that the menus are consistent and follow a pattern. A manner of making the menus is discussed below with respect to Figures 55 and 56. This consistency or pattern between the different menus provides a level of comfort to the subscriber when encountering new menus. In the major menu 1020 example of Figure 27a, the

upper sash 1502 and lower sash 1504 remain consistent throughout menus in the preferred embodiment. The logos 1508, icons 1510 and titles also remain consistent in the same locations.

In the major menu 1020 example of Figure 27b, the customized windows 1002, 1004 in the upper corners remain constant from menu to menu. Also, the name of the menu and category are at the top and center of the menu screen 1039. To make the menu aesthetically pleasing, the instructions are given across the center of the screen and choices in large legible type are provided. Additionally, at the bottom of most menu screens 1011, the subscriber is given the option of returning to regular TV or returning to the home menu 1010.

Figures 27c-27g show alternative embodiments of major menus 1020 for the home menu shown in Figure 25a. Figures 27c-27g show various major menus directed to the type of subscription services available (basic service 1420, basic plus 1422, economy package 1424, ala carte and premium channels 1426). These menus also provide promotional or advertising information, for example, the cost for the particular subscription service. Figure 27g shows a major menu for the Learning Channel 1428, one of the individual channels shown in the home menu of Figure 25a.

These menus may be grouped in similar colors or shades of colors. For example, the basic subscription service could have a light pink color. As the subscription services increase in terms of the number of channels available, the color shading may increase correspondingly. Therefore, the premium subscription service (ala carte service) would have a dark red color, contrasting with the light pink color of the basic subscription service.

In Figure 27b, the movie titled Terminator Four is highlighted, signifying that the subscriber has chosen this program option from the hit movie major menu. Figures 28a and 28b show submenus 1050 which would follow the selection of Terminator Four on the hit movie major menu. In Figure 28a, the sash across the top of the screen 1502 remains constant from major menu 1020 to program description submenu 1050. Again in Figure 28b, for the comfort of the subscriber, the left upper window 1002 remains the same and shows the current time. The upper right-hand corner 1004 carries a message stating the next start time for the movie selected.

## E.2. Notification

Figures 29a and 29b are notification submenus informing the user that his program selection is about to begin (e.g., counting down until start time). Using this submenu, the set top terminal 220 warns the user prior to switching him away from the channel he is viewing to a

prior selected program channel. This notification submenu is provided to the subscriber approximately one or more minutes before the set top terminal 220 changes the viewing channel.

Both notification submenu examples allow the subscriber to cancel his movie order. In Figure 29a, the subscriber is notified in the center of the screen that he may cancel within the first five minutes. In Figure 29b the subscriber may press escape to cancel his order without charge. The notification submenu of Figure 29b informs the user of the start time at the upper right portion of the screen.

The notification submenu of Figure 29b is a simple three-window menu. A strip window at the top of the screen 1103 notifies the subscriber of the movie selected and the amount of time before the movie will begin. The center window is a large video window 1556 for displaying a scene from the movie. At the bottom of the screen the submenu carries another strip menu 1105 which informs the user that he may escape from his program selection without charge.

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Using a notification submenu 1127, the set top terminal 220 may allow a subscriber to view other programs prior to his movie start time. The subscriber is amply notified of the start time of his program and effortlessly moved to the correct channel to view his selected program. This notification-type submenu may be used to move a subscriber from his current channel to any preselected channel for viewing a program which has been ordered at an earlier time. In the preferred embodiment, the amount of time provided by the notification submenu may be customized by the subscriber to a length of his preference. The notification submenu also allows a subscriber to cancel or escape from his previously selected program choice and avoid any charges. If a subscriber cancels or escapes he is returned to the channel that he is currently watching.

#### E.3. Escape Time Expired

As shown in Figure 30a, in the preferred embodiment, the subscriber is given a During Program Menu, specifically an Overlay menu 1130 to inform him when his five minutes of movie escape time have expired. Once the time has expired the subscriber will be billed for the movie selection.

#### E.4. Escape After Charged

Figure 30b is an overlay menu 1133 warning the user that he is escaping a program after being charged for the order of that program. The warning overlay menu 1133 of Figure 30b follows in sequence and is prompted by a hidden menu which constantly monitors for subscriber

input during viewing of the program. The hit movie hidden menu (not shown) specifically waits for certain key entries by the subscriber. In particular, the hit movie hidden menu awaits for a key stroke such as escape, cancel or an icon selection. If the escape button is depressed during the viewing of a hit movie the overlay menu of Figure 30a or Figure 30b will be shown. A strip menu in the lower sash of Figure 30b allows the subscriber to resume full screen viewing of the hit movie.

Figure 30b is a representative example of an overlay menu 1133. It has a dark lower background sash and a light colored informational sash. The upper portion of the screen continues to display the video of the program selected. Figure 30c is a reentry to ordered selection submenu 1135 for the hit movie category. The reentry to ordered selection submenus appear whenever a subscriber selects a programming option (program, event, or subscription channel), that the subscriber has already ordered. This menu has a program title window with a text title entry, and a description of the order that has already been placed for the program (or channel). In the preferred embodiment, the submenus which allow reentry to ordered selection provide the subscriber with the added option of joining the program within any fifteen minute interval. This special feature of the preferred embodiment allows a subscriber who has viewed one-half of a particular program to rejoin the program at the half-way point. In this manner, the program delivery system mimics a VCR tape recording of the program. For example, if a subscriber had rented a videotape of the movie Terminator 4 and had watched thirty minutes of the movie, he would have left his videotape in the thirty minute position.

#### E.5. Reenter Program

With the menu of Figure 30c a subscriber to the system who has watched thirty minutes of Terminator 4 may reenter the Terminator movie at the thirty-one to forty-five minute interval as shown in Figure 30c. The nine-fifteen minute blocks of the menu display blocks are representative of the choices available for a two-hour hit movie. Other variations are possible depending on the length of the movie and the timing intervals desired.

#### E.6. HDTV Promotion

Figures 31a and 31b relate to HDTV. Figure 31a is an example of a menu 1032 advertising a new feature of the system. Promotional menus, such as Figure 31a, may be dispersed throughout the menu driven program selection system. This particular menu describes the HDTV feature and explains its unavailability until a future date. Figure 31b shows the

integration of HDTV services into the menu driven program delivery system. If the subscriber selects the major menu for HDTV, he will either receive a description of the service with a suggestion to order the system, or a text note that he is a current subscriber and a listing of the currently available program selections in HDTV 1232. If the subscriber has not paid to join the particular service, HDTV, he may be allowed to join one of the programs in progress for a limited time as a demo to entice the subscriber to order.

If the subscriber has paid his HDTV fees, a subscriber proceeds as he would in any other major menu screen.

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This particular major menu shows an example of how a follow-on or second screen may exist for the same menu. In this particular case, a second screen exists for the major menu HDTV 1032. The subscriber may access the second screen 1232 by selecting the last menu display block in the lower part of the screen "Other HDTV Selections". Following this selection, the subscriber will be given a second screen of program selections. In this manner, any menu can have multiple screens with many program choices. This type of screen pagination on one menu allows the packager to avoid categorizing program selections within that same menu. In an alternative embodiment, the options available to the subscriber may be scrolled on one menu screen with the text within the menu display blocks changing as the subscriber scrolls up or scrolls down.

#### E.7. Programs Available

In the preferred embodiment, TV guide services, listing programs available on network schedules, will be available on a major menu, as shown in Figure 32a. In the preferred embodiment, the major TV guide menu 1036 would offer submenus, such as network schedules for the next seven days, today's network schedules for the next six hours, and TV guide picks for the next seven days. If the particular set top terminal 220 has been subscribed to the TV guide service, the subscriber may proceed to a submenu showing schedules of programs. If the subscriber chooses the network schedule submenu 1236, he is offered a list of network schedules to choose from as shown in Figure 32b. If a subscriber were to choose, for instance, HBO, the submenu 1238 shown in Figure 32c would appear. This submenu allows a subscriber to choose the program date that interests him. Following selection of a date, the subscriber is shown a more specific submenu 1242 listing programs available on the particular date as shown in 32d.



Following a program choice, a program description submenu 1244 is placed on the television screen as shown in Figure 32e. In addition, from this program description submenu, the viewer may choose to record the selected program on his VCR using the guide record feature. If the guide record feature is chosen, the guide record submenu 1248 shown in Figure 32f provides the subscriber with further instructions. In order for the set top terminal 220 to perform the guide record functions and operate the VCR, control signals must be sent from the set top terminal 220 to the VCR via the video connection 650 or via a separate connection between the set top terminal 220 and the VCR. The VCR must be capable of interpreting these control signals from the set top terminal 220 and performing the desired function (such as, activating the record feature). In the preferred embodiment, the VCR control signals are sent with the video signal and output from the output 650, as described above.

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Figures 32g and 32h refer to the broadcast TV menu option available in Figure 23b. Figure 32g is a major menu 1046 displaying subcategories of programs available on a group of channels called generically "broadcast TV." For each subcategory there is a separate submenu listing programs that are available in the particular subcategory on a group of channels called broadcast TV.

By using the broadcast TV menu, the subscriber does not need a written guide of available television programming on the major networks. Although the preferred embodiment categorizes television programs available on the major networks, a simple chronological listing of programs may also be used.

Following a subcategory selection on the broadcast TV menu such as favorite channels, the set top terminal 220 will display a submenu of programs as shown in Figure 32h. The favorite channel program menu 1256 of Figure 32h allows the subscriber to choose among eight programs in progress at 9:45 p.m. on a broadcast TV network.

Using this methodology, the subscriber may also be allowed to choose among television programs which will be available for viewing in the next half hour or hour. When the time of the preselected program is approaching, the set top terminal 220 will display a notification menu or window to the subscriber (similar to Figure 29a and 29b) informing him of an eminent change of channels to a previously selected program.

#### E.8. Mood Questions

Once a personal profile has been created (in a particular set top terminal 220), it can be indefinitely stored in nonvolatile memory. A selection at the home menu screen 1010 activates the program selection feature. Following activation of the feature, the set top terminal 220 will present the viewer with a series of brief questions to determine the viewer's mood at that particular time. For example, the first mood question screen 1260 may ask the viewer to select whether he desires a short (30 minute), medium (30-60 minute), or long (60 plus minute) program selection, as shown in Figure 32i. The second mood question screen 1262 requests the viewer to select between a serious program, a thoughtful program, or a light program, as shown in Figure 32j. And the third mood question screen 1264 requests whether the user desires a passive program or an active program, as shown in Figure 32k. The viewer makes his selection in each question menu utilizing the cursor movement keys and "go" button on his remote control 900. A variety of other mood questions are possible such as fatigue level of the viewer.

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After the viewer has responded to the mood question menus which determine his mood, the set top terminal 220 finds the best programming matches for the viewer and displays an offering of several suggested programs to the viewer (three or more programs are preferred). The matching algorithm compares the viewer profile data with information about the program derived from the program control information (or STTCIS) signal, such as show category, description type, length, etc. Using the personal profile information and mood questions suggested above, the following types of outcomes are possible. If the set top terminal 220 is presented with a young lady viewer, educated in Boston who watches sitcoms on a regular basis, and desires a short, light, passive program, a match might be found with the 30-minute sitcom Cheers, the sitcom Designing Women, and Murphy Brown. Taking another example, a middle-aged male viewer from the Boston area, wishing a longer length, light, passive program suggestion might be suggested the New England Patriots game, the Boston Red Sox game and a science fiction movie.

With this program selection feature, the set top terminal 220 can intelligently assist the specific viewer in selecting a television program. Instead of the set top terminal 220 requiring an input of personal profile information, the terminal may also "learn" a subscriber's viewing habits by maintaining historical data on the types of programs the viewer has most frequently watched. This information can then be fed to the matching algorithm which selects the suggested television programs.

Using this methodology, it is even possible for the set top terminal 220 to suggest programs for two viewers. By using two sets of viewer profile information, the matching algorithm can find the best match for joint viewing. For example, the set top terminal 220 can suggest programs for a couple watching television simultaneously.

#### E.9. Promotions

Figures 33a, 33b, and 33c demonstrate the use of promotional menus to sell subscriptions to services in the system. In particular, Figure 33a is a promotional menu 1304 for Level A interactive services. Level A interactive services offers subscribers additional information about programs such as quizzes, geographical facts, etc. This information may be received by the set top terminal 220 in several data formats including VBI and in the program control information signal. Figure 33b is a promotional menu 1306 for Level B interactive services which include a variety of on-line type services such as Prodigy, Yellow Pages, Airline Reservations, etc.

Figure 33c is a promotion menu 1308 for the Level C interactive services. The Level C interactive services utilize local storage such as CD technology to offer an enormous range of multi-media experiences. The Level C interactive services require a hardware upgrade as described earlier. Specially adopted CD-I and CD-ROM units are needed for this service.

#### E.10. Level A Interactive

Figures 33d through 33j show menus that are available using the interactive Level A services. When interactive Levels A services are available in a television program, the system will display the interactive logo consisting of the letter "I" and two arrows with semicircular tails. In the preferred embodiment the set top terminal 220 will place the interactive logo on the television screen as an overlay menu 1310. In the preferred embodiment, the set top terminal 220 will detect that there is data or information available about a television program which can be displayed to a subscriber using the interactive service. When the set top terminal 220 senses that there is interactive information available, it will generate the interactive logo overlay menu and place it on the television screen. For example, the set top terminal 220 will detect that information on a television program is being sent in the vertical blanking interval (VBI) and generate an interactive logo overlay menu which will appear on the subscriber's television screen for approximately fifteen seconds during each ten minute interval of programming.

When the subscriber sees the interactive logo on his television screen, he is made aware of the fact that interactive services are available in conjunction with his television program. If

the subscriber presses his interactive remote control button, an additional overlay menu will be generated by the set top terminal 220 and placed on the screen. This menu 1310 is shown in Figure 33d being overlayed on an interactive television program. From this menu the subscriber may select interactive features or return to the television program without interactive features.

If the subscriber selects interactive features he will be presented with the interactive Level A submenu 1312 in Figure 33e. From this submenu the subscriber may choose a variety of different types of textual interactivity with the current television program. Some examples are quizzes, fast facts, more info, where in the world, products, etc. At any time during the interactive submenus the user may return to the television program without interactive features.

This interactive submenu has an example of taking a complete television program video, scaling it down to a smaller size and directing the video into a video window of a submenu.

Figure 33f shows an interactive fast facts submenu 1314. In this submenu textual information is given to the subscriber in the lower half of his screen. This textual information will change as additional data is received by the set top terminal 220 relating to this television program.

Figure 33g shows the use of the subcategory "more information" in the interactive service. This submenu 1316 gives additional information related to the television program to the viewer in textual form in the lower half of the screen. Figure 33h is an interactive submenu 1318 for the subcategory "quiz." In this interactive subcategory, the user is presented with questions and a series of possible answers. If the subscriber desires, he selects one of the answers to the quiz question. After his selection, the set top terminal 220 sequences to another menu. The set top terminal 220 sequences to the interactive quiz answers submenu which informs the subscriber whether he has chosen the correct answer or not. Figure 33i shows a correctly answered quiz question 1320 and Figure 33j shows an incorrectly answered quiz question 1324. In the preferred embodiment, the menu graphics for both of these menus 33i and 33j is the same. The only difference is in the text which can be generated by the text generator of the set top terminal 220.

#### E.11. Level B Interactive

Figure 34a is an example of a submenu for Level B interactive services. From this menu screen 1330, any of a number of on-line data services could be accessed. In Figure 34a, the airline reservations selection has been selected by the subscriber.

E.12. On-Line Data

Figures 34b through 34l provide an example of a sequence of menus that a subscriber may encounter with an on-line data service. In particular, this example relates to airline information and reservations and the subscriber in this sequence is reserving and purchasing airline tickets. Figure 34b is an example of the first submenu 1332 for a data service offering various options. In this case, the subscriber has the option of checking current reservations or making new reservations. In each of these submenus related to a data service, the subscriber is able to return to the home menu 1010 or regular cable TV and exit the data service. Figure 34c requires the subscriber to enter information related to his airline reservation in this submenu 1334, such as: domestic or international flight, year of flight reservation, month of flight reservation.

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Figure 34d is another submenu in the airline information and reservation data service. Figure 34d provides an example of how the subscriber may choose among many options on a single screen 1336. In this manner, the preferred embodiment of the system can avoid the use of a separate keyboard for textual entry. Although a separate keyboard may be provided as an upgrade, it is an added expense which some subscribers may wish to avoid. Figure 34d shows an "eye off the remote" approach to entering information. Figure 34d allows the user to chose the State in which he will depart and the state in which he will arrive. The airline information reservation submenu 1338 shown in Figure 34e allows a subscriber to choose the airports from which he will depart and arrive and also the approximate time period of his departure and his arrival. Figure 34f, an airline information and reservation submenu 1340, allows a subscriber to view six available flights. A subscriber may select one of the flights to check on its availability.

Figure 34g, an airline information and reservation submenu 1342, allows a subscriber to enter the month, day and year for the availability date he desires. In this submenu, the subscriber is offered the option of correcting any errors in the entered information. This particular submenu is for a particular flight, including flight number.

Figure 34h, an airline information and reservation submenu 1344, allows a subscriber to view remaining seats available on a flight. From the menu, the subscriber may select his seat assignments. This submenu is an example of how information may be graphically shown to a subscriber using a portion of the menu and different coloring schemes. In this menu, the lower half of the screen shows the passenger compartment of an airplane with all the seat locations

graphically represented by square blocks. By coloring the available seat locations in blue and the unavailable seat locations in a different color, the menu can present a great deal of information in a limited amount of space. This graphic presentation of information for the interactive on-line data services is an important method of visually displaying large amounts of information to the subscriber.

Figure 34i, an airline information and reservation submenu 1346, allows the subscriber to choose a one-way or round-trip ticket and to confirm his reservations. If the subscriber desires to proceed, he may charge his airline ticket to his credit card by choosing the appropriate strip menu on the lower part of the screen.

Figure 34j, an airline information and reservation submenu 1348, is an example of how credit card purchases may be made using the interactive on-line data services. In this particular menu, the subscriber is charging a round-trip plane ticket on his credit card. The subscriber simply needs to enter his credit card number, expiration date, and credit card type to charge his airline ticket.

Figure 34k, an airline information and reservation submenu 1350, is an example of a menu which may be shown whenever an on-line data service is processing a request sent by the subscriber. In this particular menu, the on-line data service is processing the subscriber's credit card charge for his airline ticket.

Figure 34l, an airline information and reservation submenu 1352, confirms a subscriber's airline ticket purchase and passes on information on where the ticket may be picked up.

#### E.13. Digital/Audio Program Choices

Figure 35a is a major menu 1038 displaying the digital/audio program choices which are available for subscribers who have paid the monthly fee. In a chart format, the major menu shows the top five, top ten, and top forty songs available in six different categories of music. Below the chart, the system is able to provide a text message describing the particulars of the audio program selected.

The digital/audio feature of the invention allows a subscriber to listen to CD quality audio selections through his stereo. This can be accomplished by running cables directly from the set top terminal 220 to the subscriber's amplifier/stereo system. Alternatively, the user may listen to audio selections through his television system.

Figures 35d and 35e are the same major menu 1038 as Figure 35a but shows a different selection and a different program description in the lower text 1408, 1412. From any of the menu screens for the digital/audio feature, the subscriber may return to regular cable TV with the press of a single button.

Figures 35b and 35c are promotional menus 1400, 1404 for the digital/audio feature. Using the same logos and menu format, the system can provide a text description enticing the subscriber to pay the monthly fee and join the service. In Figure 35b, the menu allows the user to test the system with a free demonstration. The menu in Figure 35c allows the subscriber to request additional promotional information about the system. Both Figures 35b and 35c are representative of promotional menus that may be used throughout the menued system.

E.14. Monthly Account Review

Figures 36a, 36b and 37a, 37b relate to the monthly account review capabilities available to the subscriber. In the preferred embodiment, the subscriber may choose to access the monthly account review capability from both the introductory menu 1000 and home menu 1010. The monthly account review screen shows alternative window types that are available to the set top terminal 220. For example, in the upper left-hand corner of the monthly account review, the current time and date are both shown. The upper right-hand corner provides the subscriber with instructions on how to use the monthly account review capability. Figure 36b also shows that windows may be created in a variety of shapes. For instance, on the lower right-hand part of the screen 1612 two triangularly shaped windows with messages are shown. In addition, on the left lower part of the screen 1612 a window in the shape of a trapezoid is shown with a textual message inside.

The monthly account review provides a list of charges from the first day of the month to the date of viewing for each major menu. Charges are incurred on a pay-per-view basis and on a subscription basis (weekly, monthly, quarterly, etc.).

At the lower part of the screen, the total of the charges incurred for the month is listed. The account status can also be calculated on a weekly, quarterly or semi-annual basis.

If the user moves his cursor to highlight one of the eight menus listed and depresses the "go" button, he will obtain further billing information on the menu. Figures 36a and 36b show in screens 1610 and 1612, respectively, the subscriber selecting menu A for further information.

Figures 37a and 37b are submenus for the monthly account review and displays detailed billing information about selections made on menu A. The date of each movie selection, title of the movie, and price for each movie is displayed (1614, 1616). Also, any discounts which have been granted are displayed. The total charges on this menu and the day in which the menu will be changed are shown in the lower part of the screen. From this submenu, the subscriber may either return to regular TV or return to the major menu for the monthly account review. If the submenu information does not fit on a single screen, an extended submenu may be utilized with follow on extension screens. Alternatively, a scrolling feature may be used enabling the subscriber to scroll additional information onto the first submenu screen.

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The account information necessary to create the monthly account review menus may be stored either in the memory of the set top terminal 220 or at a remote location that communicates with the set top terminal 220. In the simplest embodiment, the set top terminal 220 records a subscriber's selections locally and calculates the monthly account review based upon the subscriber's selections which require the payment of fees. This monthly account information is stored locally and sent to the cable headend 208 at least once a month for back-up and billing purposes.

Alternatively, the subscriber's viewing selections and billing information may be continuously maintained at the cable headend 208 or a remote site connected via communication lines to the cable headend 208. The cable headend 208 or the remote site must regularly transmit the monthly account information to the set top terminal 220. Each embodiment has advantages and disadvantages. If the account information and processing is done locally at the set top terminal 220, each set top terminal 220 must be provided with the memory and necessary processing capability to maintain the account. This greatly increases the cost of a set top terminal 220. If the account information is maintained remotely, the remote site must remain in regular contact with the set top terminal 220 in order to provide the subscriber with billing information.

To accommodate homes with multiple viewers two or more set top terminals 220 may be placed on a single bill or two accounts may be created for one set top terminal 220.

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